

REMARKS

I. Introduction

In Response to the March 16, 2009 Office Action, Applicants have incorporated the limitations of claim 9 into claim 1 and cancelled claims 8 and 9, without prejudice.

For the reasons set forth below, Applicants respectfully submit that all pending claims are patentable over the cited prior art references.

II. The Rejection Of Claims 1-6 And 8 Under 35 U.S.C. § 103

Claims 1, 3-6 and 8-9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshimoto et al. (US 2003/0104265) in view of Kumata et al. (USP No. 4,508,793); and claim 2 as being unpatentable over Yoshimoto and Kumata and in further view of Sugita et al. (USP No. 6,723,463). Applicants respectfully traverse the pending rejection for at least the following reasons.

With regard to the present invention, amended claim 1 recites a polymer electrolyte fuel cell in which a gas supply pipe is extended into an inlet manifold beyond an end plate located at a nearest end of a cell stack in the laminating direction of the cell stack, and an extended part of the gas supply pipe has a plurality of holes in the top thereof, which are spaced apart at decreasing intervals inwardly.

One feature of the present disclosure is that an extended part of the gas supply pipe has a plurality of holes in the top which are spaced apart at decreasing intervals inwardly. For example, as shown in Fig. 13 of the present disclosure, the gas supply pipe 11 had a series of holes 31 which are spaced at decreasing intervals along the inward direction. As a result of this

feature, the proportion of opening is increased from the opening end to the closed end to prevent the loss of pressure of the supplied gas throughout the inlet manifold.

It is admitted that Yamamoto and Kumata fail to disclose an extended part of the gas supply pipe has a plurality of holes in the top which are spaced apart at decreasing intervals inwardly. Rather, Kumata teaches a series of holes having equal spacing, but gradually smaller radius. It is alleged that it would have been obvious in view of Kumata to teach the shortening of the spacing of claim 1, so that the interval between adjacent holes is decreased inwardly. However, the present disclosure increases the number of same sized holes in an inward direction. By increasing the number of same sized holes instead of decreasing the diameter of the holes, manufacture of the inlet tube is made less expensive and quicker by preventing the need for changing the size of drill bit needed to make the different sized holes. As such, it is not obvious to utilize Yamamoto and Kumata to arrive at the above cited limitation of amended claim 1 of the present disclosure.

Another feature of the present disclosure is that the fuel cell has a gas supply pipe which extends beyond an endplate located at a nearest end of the cell stack into the inlet manifold in the laminating direction of the cell stack. As can be seen in Figs. 12 and 13 of the present disclosure, the gas supply pipe 11 extends into the cell stack 1, past the end plate 5. As a result of this feature, the gas pressure inside the inlet manifold can be kept uniform, thereby uniformly supplying the gas to the respective cells. In addition, this feature allows for the heat in the pipe to be exchanged between the gas and the extended part of the gas supply pipe, so that the temperature of the gas becomes even. As a result, the relative humidity of the gas supplied to the respective cells becomes uniform, and hence the hydration of the polymer electrolyte membranes in the respective cells becomes more even.

It is admitted that Yamamoto fails to disclose that the fuel cell has a gas supply pipe which extends beyond an endplate located at a nearest end of said cell stack into the inlet manifold in the laminating direction of the cell stack. It is alleged that Kumata shows an air pipe 45 in the air chamber 30 that feeds air uniformly into the air channels and communicates with the auxiliary manifold 20a through air holes 19. However, as is clear from Figs. 7-15, nowhere does the fuel cell of Kumata disclose a gas supply pipe extended into the inlet manifold beyond an end plate in the laminating direction of the cell stack. Rather, the air pipe extends parallel to plane of the cell stack, not in a laminating direction (i.e., perpendicular to the cell stack).

In contrast, the present disclosure shows, in Fig. 2 how the gas supply pipe 12 extends beyond the end plate 5. Applicants pointed out this feature to the Examiner during an interview on December 17, 2008, during which the Examiner agreed that the feature is not recited in the prior art. As such, the combination of Yoshimoto and Kumata does not render claim 1 obvious. Moreover, Sugita does not and is not relied upon to remedy this deficiency.

In order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. As Yoshimoto, Kumata and Sugita fail to teach or suggest a polymer electrolyte fuel cell in which a gas supply pipe is extended into said inlet manifold beyond an end plate located at a nearest end of said cell stack in the laminating direction of said cell stack, and an extended part of said gas supply pipe has a plurality of holes in the top thereof, which are spaced apart at decreasing intervals inwardly, it is submitted that Yoshimoto, Kumata and Sugita do not render claim 1 obvious. Accordingly, Applicants submit that claim 1 is patentable over the cited prior art.

III. All Dependent Claims Are Allowable Because The Independent Claim From Which They Depend Is Allowable

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as amended claim 1 is patentable for the reasons set forth above, it is respectfully submitted that all pending dependent claims are also in condition for allowance.


IV. Conclusion

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication of which is respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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